

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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|--|---|---|
| Applicant's or agent's file reference<br><b>02SGL0226WOP</b>                 | FOR FURTHER ACTION  | See Form PCT/IPEA/416                               |
| International application No.<br><b>PCT/EP2004/003416</b>                    | International filing date (day/month/year)<br><b>31.03.2004</b> | Priority date (day/month/year)<br><b>02.04.2003</b> |
| International Patent Classification (IPC) or national classification and IPC |   |   |
| Applicant<br><b>SCHOTT AG</b>  |   |   |

|   |                                   |   |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
|---|-----------------------------------|---|-----------|---------------------|--------------------------|------------|----------|--------------------------|-------------|--|--------------------------|------------|----------------------------|-------------------------------------|-----------|---|--------------------------|------------|-------------------------|--------------------------|-------------|--|--------------------------|--------------|---|
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>9</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> |                                   |   |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <p>4. This report contains indications relating to the following items:</p> <table><tr><td><input checked="" type="checkbox"/></td><td>Box No. I</td><td>Basis of the report</td></tr><tr><td><input type="checkbox"/></td><td>Box No. II</td><td>Priority</td></tr><tr><td><input type="checkbox"/></td><td>Box No. III</td><td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td></tr><tr><td><input type="checkbox"/></td><td>Box No. IV</td><td>Lack of unity of invention</td></tr><tr><td><input checked="" type="checkbox"/></td><td>Box No. V</td><td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VI</td><td>Certain documents cited</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VII</td><td>Certain defects in the international application</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VIII</td><td>Certain observations on the international application</td></tr></table>   |                                   | <input checked="" type="checkbox"/>   | Box No. I | Basis of the report | <input type="checkbox"/> | Box No. II | Priority | <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | <input type="checkbox"/> | Box No. IV | Lack of unity of invention | <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | <input type="checkbox"/> | Box No. VI | Certain documents cited | <input type="checkbox"/> | Box No. VII | Certain defects in the international application | <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |
| <input checked="" type="checkbox"/>   | Box No. I                         | Basis of the report   |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input type="checkbox"/>  | Box No. II                        | Priority  |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input type="checkbox"/>  | Box No. III                       | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input type="checkbox"/>  | Box No. IV                        | Lack of unity of invention  |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input checked="" type="checkbox"/>   | Box No. V                         | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input type="checkbox"/>  | Box No. VI                        | Certain documents cited   |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input type="checkbox"/>  | Box No. VII                       | Certain defects in the international application  |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input type="checkbox"/>  | Box No. VIII                      | Certain observations on the international application   |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| Date of submission of the demand  | Date of completion of this report |   |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| Name and mailing address of the IPEA/EP   | Authorized officer                |   |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| Facsimile No.   | Telephone No.                     |   |           |                     |                          |            |          |                          |             |  |                          |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/003416

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
    - ☐ international search (Rule 12.3 and 23.1(b))
    - ☐ publication of the international application (Rule 12.4)
    - ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
  - ☐ the international application as originally filed/furnished
  - ☒ the description:
    - pages 1-58 \_\_\_\_\_ as originally filed/furnished
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - ☒ the claims:
    - nos. 1-49 \_\_\_\_\_ as originally filed/furnished
    - nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
    - nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - ☒ the drawings:
    - sheets 1/8-8/8 \_\_\_\_\_ as originally filed/furnished
    - sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, nos. \_\_\_\_\_
  - ☐ the drawings, sheets/figs \_\_\_\_\_
  - ☐ the sequence listing (*specify*): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, nos. \_\_\_\_\_
  - ☐ the drawings, sheets/figs \_\_\_\_\_
  - ☐ the sequence listing (*specify*): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/003416

**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

|                               |        |  |     |
|-------------------------------|--------|--|-----|
| Novelty (N)                   | Claims | 2-4, 11, 12, 19-21, 31, 36, 37, 45         | YES |
|                               | Claims | 1, 5-10, 13-18, 22-30, 32-35, 38-44, 46-49 | NO  |
| Inventive step (IS)           | Claims |  | YES |
|                               | Claims | 1-49                                       | NO  |
| Industrial applicability (IA) | Claims | 1-49                                       | YES |
|                               | Claims |  | NO  |

## 2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: DE-A-10138108  
 D2: DE-B-1211363  
 D3: Derwent abstract 2003-285834, from  
 KR2002050331  
 D4: FR-A-1306851  
 D5: US-A-4246433  
 D6: "Characterization of tin at the surface of  
 float glass", Williams et al., J. Non-Cryst.  
 Solids 242 (1998), pages 183-188  
 D7: DE-A-10003948  
 D8: EP-A-1078889.

*PCT Article 33(1) to (3)*

Method claims 1-33

1. The present application fails to meet the requirements of PCT Article 6. The reasons are the following:
  - in the field of glass furnaces, it is standard practice to use a melting unit with walls that

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Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

are cooled (for example, by blasting air) in order to prevent the molten material from damaging the walls. The above expression encompasses many more options than the skull crucible and electric furnace described in the present application. The scope of **claim 1** therefore goes beyond that supported by the description and the drawings (PCT Article 6).

- The subject matter of claim 1 is, in part, defined in terms of the result to be achieved (minimal energy consumption, mutually adjusted temperature and throughput). A reduced or minimal energy consumption is clearly desirable. The adjustment of the temperature and/or the throughput as a function of the required residence time is standard practice. Desirable or conventional features of this type cannot be regarded as characterising features. Therefore, the subject matter of claim 1 is not considered to be novel (PCT Article 33(1) and (2)).

- 2.1 The additional features of claims 2-4 relate to a conventional mathematical model of energy consumption. A person skilled in the art would expect that the energy consumption per weight unit of melt product decreases as the temperature rises. Since the adjusted throughput is greater at a higher temperature, the claimed product is obvious.

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Thus, the subject matter of **claims 2-4** does not involve an inventive step (PCT Article 33(1) and (2)).

- 2.2 The additional features of claims 5, 6, 7, 10, 13, 16, 17, 18, 24, 25, 27-30, 32 and 33 are known from document D1 (see the corresponding passages cited in the search report). Thus, the subject matter of claims 5, 6, 7, 10, 13, 16, 17, 18, 24, 25, 27, 28-30, 32 and 33 lacks novelty (PCT Article 33(1) and (2)).
- 2.3 The additional features of claims 8, 11, 12, 14, 19-20, 22 and 31 are routine measures (see also the associated objections set out in points 5. and 6. below in relation to the device claims). Thus, the subject matter of claims 8, 11, 12, 14, 19-20, 22 and 31 does not involve an inventive step (PCT Article 33(1) and (3)).
3. Regardless of the aforementioned objections, the subject matter of **claim 1** lacks novelty and, in consequence, the requirements of PCT Article 33(1) and (2) are not satisfied.

Document D2 discloses a method for melting glass in a furnace with electrodes and cooled walls (see claim 13), a reduced amount of energy being required for the refinement at a temperature prevalent in the central part of the furnace (see

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column 8, lines 15-21). Since the glass is satisfactorily refined (see column 7, lines 9-23), it can be assumed that the throughput is adapted as a function of the required residence time.

- 4.1 The additional features of claims 5, 6, 8-10, 13-15, 18, 22, 23, 25, 26, 28-30, 32 and 33 are either disclosed in document D2 or are implicit therefrom (see the corresponding passages of text in the search report). Thus, the subject matter of claims 5, 6, 8-10, 13-15, 18, 22, 23, 25, 26, 28-30, 32 and 33 lacks novelty (PCT Article 33(1) and (2)).
- 4.2 The additional features of claims 11, 12, 17, 19, 21 and 31 are routine measures. Thus, the subject matter of **claims 11, 12, 17, 19, 21 and 31** does not involve an inventive step (PCT Article 33(1) and (3)).

Method claims 34-45

5. The present application fails to meet the requirements of PCT Article 33(1) because the subject matter of **claims 34, 35 and 41-44** lacks novelty (PCT Article 33(2)).

Document D1 (see figure 4) discloses a skull crucible (15) for melting glass, with an induction coil for the direct heating of the material to be

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melted. The systems for the continuous supply of material to be melted and for the continuous removal of molten material are implicit. The temperature regulating system and the system for adjusting the throughput of material to melted are also implicit. The method steps that lead to the determination of the temperature  $T_{eff}$  are not technical features of the device and therefore cannot be used to delimit the subject matter of claim 34 over the prior art.

6. Dependent claims 36, 37 and 45 do not contain any features which, in combination with the features of any claim to which they refer back, meet the PCT requirements for inventive step (PCT Article 33(1) and (3)).

- 6.1 With regard to claim 37, a jet for the introduction of gas is known from D1 (see figure 4) although said jet does not discharge into the skull crucible. A jet of this type is disclosed in document D3 and is an obvious option that a person skilled in the art would use, according to the circumstances, in a device as per document D1.

A stirrer is a conventional alternative to a jet for stirring and homogenising the molten material. In consequence, the subject matter of **claims 36 and 37** does not involve an inventive step.

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6.2. With regard to **claim 45**, a platinum surface that reflects radiant heat is disclosed in document D4. A person skilled in the art would use this feature in combination with the features of a device as per document D1, without thereby being inventive.

7. Regardless of the aforementioned objections, the subject matter of **claims 34 and 38-40** lacks novelty (PCT Article 33(1) and (2)).

Document D5 discloses a glass melting furnace with walls that are cooled by a blast of air (see figure VII, (80) and column 5, lines 25-27) and with cooled electrodes (28) (see also column 5, lines 41-43) which are used in recesses in the cooled walls. The temperature regulating system and the system for adjusting the throughput of material to be melted are implicit.

Product claims 46-49

8. The present application fails to meet the requirements of PCT Article 33(1) because the subject matter of claims 46 and 47 lacks novelty (PCT Article 33(2)).

A melting method as per one of claims 1-33 does not give rise to a technical feature by means of which the subject matter of **claims 46 and 47** can be distinguished from the prior art. The melting

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citations and explanations supporting such statement

and refining at a very high temperature, the associated bubble size distribution and the associated state of the Sn-ions are (also in part implicitly) known from D7 (whole document) and D8 (claims 1 and 6, paragraphs [0061] and [0066]).

9. Moreover, document D6 discloses a glass (see table 1) in which the ratio of  $\text{Sn}^{2+}$  to  $\text{Sn}^{1-}$  ( $=\text{Sn}^{2+} + \text{Sn}^{4+}$ ) is greater than 0.69. The subject matter of **claim 47** therefore lacks novelty (PCT Article 33(1) and (2)).
10. The objections raised in points 8. and 9. above apply to claims 48 and 49, which relate to a glass product. The subject matter of **claims 48 and 49** therefore lacks novelty (PCT Article 33(1) and (2)).

**Article 33(4) PCT**

11. **Claims 1-49** meet the requirements of PCT Article 33(4) because the method, melting devices and products can be used, for example in the field of display glass production.